

## RV SONNE

### SO 293 AleutBio

Aleutian Trench Biodiversity Studies

24. July – 06. September 2022

Dutch Harbor (Alaska, USA) – Vancouver (Canada)

### 1. Weekly report

23. July – 24. July 2022



On July 23, the 38 scientists from 12 nations boarded the FS Sonne in Dutch Harbor, Unalaska (USA). On board we received a warm welcome and a Corona antigen test was performed for all new arrivals, all participants tested negative.



Figure 1: RV Sonne at the pier in Dutch Harbor

In the afternoon, after a tour of FS Sonne and allocating laboratory space, the science party started to unpack the containers and the equipment was distributed to the respective laboratories and rooms; on the morning of July 24, the research equipment was assembled and lashed for departure, and the laboratories were set up and with the captain, Oliver Meyer, the deployments of the equipment for the AleutBio expedition were discussed in the hangar.



*Figure 2: Discussion of the deployment of the gear for the AleutBio expedition in the hangar.*

On the evening of July 24, the expedition begins, RV Sonne leaves Dutch Harbor and in about 23 hours we hope to reach the first station.

The AleutBio expedition aims to shed light on the distribution of marine organisms and contribute to the understanding of changes in biodiversity and its distribution in the North Pacific, the gateway to the Arctic. Thus, in addition to biogeochemical studies, the goal of the AleutBio Expedition SO293 is to analyze seafloor organisms of all sizes (protists, meio-, macro- and megafauna) in the eastern Bering Sea as well as in the Abyssal and Hadal areas of the eastern Aleutian Trench. We plan to describe biodiversity, highlight biogeographic relationships, and examine species connectivity with those from the Arctic Ocean and Kuril-Kamchatka Trench in times of rapid climate change. Bathymetric mapping will be used to explore the bottom topography to define the most appropriate location for instrument deployment.

We will analyze the seafloor topography (bathymetry), biogeochemistry, and microbiology, as well as the systematic composition, species diversity, and biogeography from protists to meio-, macro-, and megafauna in the Aleutian Trench, and investigate the evolution of selected species.

To thoroughly describe the study area, we will first map the seafloor with a multibeam echo sounder and then conduct biogeochemical and microbiological analyses with a free-fall lander system. To better

understand the range and biogeography of the organisms of the Aleutian Trench, we plan to collect animals from the water column and seafloor and, if possible, identify them to species level (including newly discovered species).

We plan to compare our new biological samples from the eastern Aleutian Trench with the biological samples from the sampling areas of the KuramBio I and II expeditions and from previous Russian expeditions. We plan integrative taxonomic work on key species that may be critical to understanding and clarifying relationships. In addition, we will use standard molecular techniques as the basis for phylogeographic surveys and connectivity studies, as well as state-of-the-art genomic techniques to integrate the data into in-depth phylogenetic analyses as well.

AleutBio will also contribute extensively to the UN Decade for Ocean Exploration in close collaboration with the Challenger 150 project (<https://www.dosi-project.org/challenger-150/>) and contribute to DOSI (Deep Ocean Stewardship Initiative - <https://www.dosi-project.org/>) via INDEEP (<https://www.indeep-project.org/>).

In addition to the scientific program, we will conduct public outreach via daily blogs (<https://aleutbio.sgn.one/>).



*Figure 3: Scientists in front of RV Sonne*

All are well and send greetings home.

Angelika Brandt (on behalf of all scientists of the AleutBio expedition)

A handwritten signature in blue ink that reads "Angelika Brandt". The signature is written in a cursive style with a long horizontal stroke at the end.

Senckenberg Research Institute and Natural History Museum Frankfurt